Complete Summary

GUIDELINE TITLE

Acute coronary syndromes: unstable angina pectoris and non-ST segment elevation myocardial infarction (NSTEMI).

BIBLIOGRAPHIC SOURCE(S)

Finnish Medical Society Duodecim. Acute coronary syndromes: unstable angina pectoris and non-ST segment elevation myocardial infarction (NSTEMI). In: EBM Guidelines. Evidence-Based Medicine [Internet]. Helsinki, Finland: Wiley Interscience. John Wiley & Sons; 2007 Nov 28 [Various]. [6 references]

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Finnish Medical Society Duodecim. Unstable angina pectoris. In: EBM Guidelines. Evidence-Based Medicine [Internet]. Helsinki, Finland: Wiley Interscience. John Wiley & Sons; 2006 Mar 15 [Various].

**** REGULATORY ALERT ****

FDA WARNING/REGULATORY ALERT

Note from the National Guideline Clearinghouse: This guideline references a drug(s) for which important revised regulatory and/or warning information has been released.

- December 3, 2008, Innohep (tinzaparin): The U.S. Food and Drug Administration (FDA) has requested that the labeling for Innohep be revised to better describe overall study results which suggest that, when compared to unfractionated heparin, Innohep increases the risk of death for elderly patients (i.e., 70 years of age and older) with renal insufficiency. Healthcare professionals should consider the use of alternative treatments to Innohep when treating elderly patients over 70 years of age with renal insufficiency and deep vein thrombosis (DVT), pulmonary embolism (PE), or both.
- February 28, 2008, Heparin Sodium Injection: The U.S. Food and Drug Administration (FDA) informed the public that Baxter Healthcare Corporation has voluntarily recalled all of their multi-dose and single-use vials of heparin sodium for injection and their heparin lock flush solutions. Alternate heparin manufacturers are expected to be able to increase heparin production sufficiently to supply the U.S. market. There have been reports of serious adverse events including allergic or hypersensitivity-type reactions, with

symptoms of oral swelling, nausea, vomiting, sweating, shortness of breath, and cases of severe hypotension.

COMPLETE SUMMARY CONTENT

** REGULATORY ALERT **
SCOPE
METHODOLOGY - including Rating Scheme and Cost Analysis
RECOMMENDATIONS
EVIDENCE SUPPORTING THE RECOMMENDATIONS
BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS
IMPLEMENTATION OF THE GUIDELINE
INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES
IDENTIFYING INFORMATION AND AVAILABILITY
DISCLAIMER

SCOPE

DISEASE/CONDITION(S)

Acute coronary syndromes, including:

- Unstable angina pectoris
- Myocardial infarction (MI) without ST elevation
- MI with ST elevation

GUIDELINE CATEGORY

Diagnosis
Evaluation
Risk Assessment
Treatment

CLINICAL SPECIALTY

Cardiology
Critical Care
Emergency Medicine
Family Practice
Internal Medicine

INTENDED USERS

Emergency Medical Technicians/Paramedics
Health Care Providers
Physicians

GUIDELINE OBJECTIVE(S)

Evidence-Based Medicine Guidelines collect, summarize, and update the core clinical knowledge essential in general practice. The guidelines also describe the scientific evidence underlying the given recommendations.

TARGET POPULATION

People with ischemic chest pain suggesting unstable angina or myocardial infarction

INTERVENTIONS AND PRACTICES CONSIDERED

Diagnosis/Evaluation/Risk Assessment

1. Electrocardiogram
2. Assessment of signs and symptoms
3. Risk factor assessment
4. Measurement of myocardial markers (troponins)
5. Exercise testing

Treatment/Management

1. Aspirin
2. Clopidogrel in addition to aspirin
3. Nitrate
4. Beta-blocker (metoprolol)
5. Low-molecular-weight (LMW) heparins (such as dalteparin) simultaneously with aspirin
6. Glycoprotein IIb/IIIa inhibitors in selected patients
7. Cardiac monitoring
8. Angiography
9. Revascularization (clopidogrel and intravenous glycoprotein IIb/IIIa [GP IIb/IIIa] inhibitor in addition to aspirin and low-molecular-weight heparin while waiting for the procedure)
10. Thrombolytic therapy
11. Immediate percutaneous coronary intervention (PCI): balloon angioplasty with stenting
12. Conservative treatment with elimination of risk factors in low-risk patients

MAJOR OUTCOMES CONSIDERED

- Mortality
- Incidence of myocardial infarction
- Incidence of ischaemic events/recurrent angina
- Need for urgent revascularization
- Sensitivity and specificity of troponin I and T for predicting adverse cardiac events in unstable angina pectoris

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The evidence reviewed was collected from the Cochrane database of systematic reviews and the database of abstracts of reviews of effectiveness (DARE). In addition, the Cochrane Library and medical journals were searched specifically for original publications.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Classification of the Quality of Evidence

Code	Quality of Evidence	Definition
A	**High**	Further research is very unlikely to change our confidence in the estimate of effect. • Several high-quality studies with consistent results • In special cases: one large, high-quality multi-centre trial
B	**Moderate**	Further research is likely to have an important impact on confidence in the estimate of effect and may change the estimate. • One high-quality study • Several studies with some limitations
C	**Low**	Further research is very likely to have an important impact on confidence in the estimate of effect and is likely to change the estimate. • One or more studies with severe limitations
D	**Very Low**	Any estimate of effect is very uncertain.

Code	Quality of Evidence	Definition
		• Expert opinion • No direct research evidence • One or more studies with very severe limitations

GRADE (Grading of Recommendations Assessment, Development and Evaluation) Working Group 2007 (modified by the EBM Guidelines Editorial Team).

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Not stated

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

The levels of evidence [A-D] supporting the recommendations are defined at the end of the "Major Recommendations" field.

Objective

- To recognize ischaemic chest pain suggesting myocardial infarction or unstable angina and to accompany the patient to a cardiac monitoring unit for active drug treatment or rapid revascularization (Hoenig et al., 2006) [**A**].
- To assess the patient's risk factors for coronary heart disease, and to refer high risk patients readily to a hospital for coronary angiography. The only symptom of ischaemia may be a general deterioration in patient's physical condition, or dyspnoea, without chest pain.

Definition

- Symptom complexes caused by a sudden narrowing or obstruction of a coronary artery are called acute coronary syndromes (ACS). These include
    - Unstable angina pectoris (UAP)
    - Myocardial infarction without ST-elevation
    - Myocardial infarction with ST-elevation (See the Finnish Medical Society Duodecim guideline "Thrombolytic therapy and balloon angioplasty in acute ST elevation myocardial infarction [STEMI]")
- The most common cause of an acute coronary syndrome is a tear in an atheroma plaque and a thrombus that is formed on it.

Risk Groups and Clinical Signs

- The presence of biochemical markers (troponins) is the single most important predictor for future coronary events. An increase in the concentration of markers is observed only after 9 to 12 hours from the symptom onset.
    - Marker-positive patients are referred to angiography and revascularization.
    - Marker-negatives are referred to exercise tolerance test.
- Unstable angina pectoris (UAP) is a heterogeneous group of conditions between stable angina pectoris (AP) and acute myocardial infarction (AMI).
- New (sudden) AP in a high-risk patient is always a serious condition.
- An aggravation in stable AP to unstable AP always necessitates a reassessment of risk and often a change in the line of treatment.
- There may not always be pain; rather, the main symptom is a decrease in exercise tolerance (sudden decrease in physical fitness) or acute left ventricle failure due to aggravated ischaemia.
- In the electrocardiogram (ECG) an ST segment depression precedes the pain. Symptomless (silent) ischaemia in a patient at risk is a significant finding. Ischaemia may not always be visible in a resting ECG. An ECG registered while the patient has pain is invariably valuable.
- If unstable AP is associated with an increase in the markers of myocardial damage, this is currently classified as a MI (non-Q infarction, or non-ST-elevation MI [NSTEMI]). See picture 1 ("Diagnostic classification of acute coronary syndromes based on ECG findings and troponin concentrations") in the original guideline document.

Treatment

- Treatment is normally carried out in a cardiac monitoring unit.
- Pharmacological treatment should be started in the first point of care.

- The mildest form (i.e. recent angina in an elderly person) may also be treated in a primary health care setting with appropriate medication and assessment of risk factors. This calls for careful monitoring and good patient information and the angina to remain stable.
- Severe or exacerbating angina requires a consideration of balloon angioplasty.
- Effective pharmacological treatment is often sufficient for the treatment of coronary heart disease if the symptoms are only mild.

Anti-ischaemic and Antithrombotic Treatment

- All patients with suspected unstable angina (no changes in ECG or myocardial markers)
    - Aspirin 100 milligrams (mg) per day continuously, unless there are contraindications (Natarajan, 2002; "Collaborative overview," 1994) [**A**].
    - Clopidogrel together with aspirin: first a loading dose of 300 mg, then 75 mg per day (Keller, Squizzato, & Middledorp, 2007; Yusuf et al., 2001) [**A**].
    - Nitrate (Natarajan, 2000) [**D**] intravenously (See the Finnish Medical Society Duodecim guideline "Nitrate infusion in angina pectoris and myocardial infarction") or orally according to the situation.
    - Beta-blocker (Natarajan, 2002) [**C**] (metoprolol). Heart rate should be 50 to 60 beats per minute and systolic pressure below 150 mmHg.
    - Low-molecular-weight (LMW) heparin (Zed, Tisdale, & Borzak, 1999; Nicholson, Milne, & Stein, 2000) [**A**] (e.g., dalteparin 100 to 120 IU/kg x 2 daily) is given for one week ("Low-molecular-weight heparin during instability in coronary artery disease." 1996). (NB: the dose is lower for elderly patients and for patients with renal failure.) Aspirin is given simultaneously.
    - Pharmacotherapy and invasive treatment do not exclude one another.
    - Glycoprotein IIb/IIIa inhibitors for selected high risk patient groups in hospital care.
    - There is no benefit from fibrinolytic therapy.

Further Treatment

- High-risk patients
    - Unstable angina and ischaemia on ECG or elevated myocardial markers (Olatidoye et al., 1998) [**A**], acute left ventricle failure (lung oedema, mitral regurgitation, hypotension)
        - Immediate angiography and revascularization. While waiting for the procedure, effective antithrombotic medication is given using clopidogrel (an initial dose of 300 mg before transportation, thereafter 75 mg daily) and an intravenous (i.v.) glycoprotein IIb/IIIa (GP IIb/IIIa) inhibitor (Natarajan, 2002) [**B**] in addition to aspirin and LMW heparin. (Fibrinolytic treatment has no effect on a vessel obstruction caused by aggregated platelets.)
- Patients without symptoms or signs of ischaemia on ECG
    - Symptom-limited exercise test performed within 2–4 days

    - If the patient has symptoms or signs of ischaemia during the exercise test or signs in ECG at a low pulse-pressure product, refer immediately to angiography.
    - If there are no symptoms or signs of ischaemia or no signs in ECG during the exercise test, or if they occur only with a high pulse-pressure product, begin conservative treatment and elimination of risk factors. Prophylaxis can be intensified by adding clopidogrel to aspirin.
- Thrombolytic therapy or immediate percutaneous coronary intervention (PCI): balloon angioplasty with stenting is indicated if an ST-elevation myocardial infarction (STEMI) develops. (See the Finnish Medical Society Duodecim guideline, "Coronary Heart Disease (CHD): Symptoms, Diagnosis and Treatment"). After the insertion of a stent, clopidogrel is used in combination with aspirin for 3–12 months.

Organizing Treatment

- UAP is a serious but often curable syndrome. A well-organized care pathway and efficient follow-up care ensures that the appropriate treatment can be given rapidly.

Related Resources

Refer to the original guideline document for related evidence, including Cochrane reviews and other evidence summaries.

Definitions:

Classification of the Quality of Evidence

Code	Quality of Evidence	Definition
A	**High**	Further research is very unlikely to change our confidence in the estimate of effect. • Several high-quality studies with consistent results • In special cases: one large, high-quality multi-centre trial
B	**Moderate**	Further research is likely to have an important impact on confidence in the estimate of effect and may change the estimate. • One high-quality study • Several studies with some limitations
C	**Low**	Further research is very likely to have an important impact on confidence in the estimate of effect and is likely to change the estimate.

Code	Quality of Evidence	Definition
		• One or more studies with severe limitations
D	**Very Low**	Any estimate of effect is very uncertain. • Expert opinion • No direct research evidence • One or more studies with very severe limitations

GRADE (Grading of Recommendations Assessment, Development and Evaluation) Working Group 2007 (modified by the EBM Guidelines Editorial Team).

CLINICAL ALGORITHM(S)

A diagnostic classification of acute coronary syndromes based on ECG findings and troponin concentrations is included in the original guideline document (Picture 1).

EVIDENCE SUPPORTING THE RECOMMENDATIONS

REFERENCES SUPPORTING THE RECOMMENDATIONS

References open in a new window

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

Concise summaries of scientific evidence attached to the individual guidelines are the unique feature of the Evidence-Based Medicine Guidelines. The evidence summaries allow the clinician to judge how well-founded the treatment recommendations are. The type of supporting evidence is identified and graded for select recommendations (see the "Major Recommendations" field).

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Appropriate evaluation and treatment of ischemic chest pain

POTENTIAL HARMS

Not stated

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Clinical Algorithm

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Staying Healthy

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Finnish Medical Society Duodecim. Acute coronary syndromes: unstable angina pectoris and non-ST segment elevation myocardial infarction (NSTEMI). In: EBM Guidelines. Evidence-Based Medicine [Internet]. Helsinki, Finland: Wiley Interscience. John Wiley & Sons; 2007 Nov 28 [Various]. [6 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2001 Apr 30 (revised 2007 Nov 28)

GUIDELINE DEVELOPER(S)

Finnish Medical Society Duodecim - Professional Association

SOURCE(S) OF FUNDING

Finnish Medical Society Duodecim

GUIDELINE COMMITTEE

Editorial Team of EBM Guidelines

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Primary Authors: Editors

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Finnish Medical Society Duodecim. Unstable angina pectoris. In: EBM Guidelines. Evidence-Based Medicine [Internet]. Helsinki, Finland: Wiley Interscience. John Wiley & Sons; 2006 Mar 15 [Various].

GUIDELINE AVAILABILITY

This guideline is included in "EBM Guidelines. Evidence-Based Medicine" available from Duodecim Medical Publications, Ltd, PO Box 713, 00101 Helsinki, Finland; e-mail: info@ebm-guidelines.com; Web site: www.ebm-guidelines.com.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on August 28, 2001. The information was verified by the guideline developer as of October 26, 2001. This summary was updated by ECRI on December 9, 2002, April 2, 2004, February 22, 2005, and May 25, 2006. This summary was updated by ECRI Institute on June 22, 2007 following the U.S. Food and Drug Administration (FDA) advisory on heparin sodium injection. This summary was updated by ECRI Institute on July 12, 2007 following the U.S. Food and Drug Administration (FDA) advisory on Troponin-1 Immunoassay. This summary was updated by ECRI Institute on March 14, 2008 following the updated FDA advisory on heparin sodium injection and again on December 23, 2008.

COPYRIGHT STATEMENT

DISCLAIMER

NGC DISCLAIMER

The National Guideline Clearinghouse™ (NGC) does not develop, produce, approve, or endorse the guidelines represented on this site.

All guidelines summarized by NGC and hosted on our site are produced under the auspices of medical specialty societies, relevant professional associations, public or private organizations, other government agencies, health care organizations or plans, and similar entities.

Guidelines represented on the NGC Web site are submitted by guideline developers, and are screened solely to determine that they meet the NGC Inclusion Criteria which may be found at http://www.guideline.gov/about/inclusion.aspx .

NGC, AHRQ, and its contractor ECRI Institute make no warranties concerning the content or clinical efficacy or effectiveness of the clinical practice guidelines and related materials represented on this site. Moreover, the views and opinions of developers or authors of guidelines represented on this site do not necessarily state or reflect those of NGC, AHRQ, or its contractor ECRI Institute, and inclusion or hosting of guidelines in NGC may not be used for advertising or commercial endorsement purposes.

Readers with questions regarding guideline content are directed to contact the guideline developer.

Date Modified: 2/2/2009